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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,720	11/13/2002	Casey J. Grant	BUR920010212	6154
30449	7590	09/15/2004	EXAMINER	
SCHMEISER, OLSEN + WATTS SUITE 201 3 LEAR JET LATHAM, NY 12033			DEO, DUY VU NGUYEN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/065,720

Applicant(s)

GRANT ET AL.

Examiner

DuyVu n Deo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/2/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 21-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (US 6,274,505).

Ito describes a method for processing a substrate comprising: providing a substrate having upper, lower opposite surfaces and an edge between the upper and lower surfaces (col. 6, line 50-55; figure 1); processing the upper surface with a solution (col. 7, line 4-5); supplying a fluid against the lower surface including the circumferential portion or edge of the substrate and controlling the T of the fluid in order to cool or heat the circumferential portion to provide an uniform etching of the substrate (col. 4, line 20-25; col. 7, line 20-34; col. 8, line 17-24, line 34-42; col. 10, line 39-47).

Referring to claim 2, the substrate is a semiconductor substrate (col. 1, line 9).

Referring to claim 5, heating the substrate would read on claimed increasing the T of the fluid above an ambient T (col. 8, line 34-42). Referring to claim 6, increasing the T of the substrate would also increase T of the etchant; therefore increasing the etch rate of the substrate.

Referring to claim 7, cooling the substrate would read on claimed decreasing the T of the fluid below an ambient T (col. 10, line 39-47). Referring to claim 8, decreasing the T of the

substrate would also decrease the T of the etchant; therefore, decreasing the etch rate of the substrate.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-16, 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futase et al. (JP 11-245143) and Ito et al. (US 6274,505).

Futase (US 6,586,161) claims the foreign priority to the JP 11-245143. Therefore, the US patent 6,586,161 would be used as the translation of JP 11-245143.

Futase describes a method for processing a semiconductor substrate comprising: providing a substrate having two surfaces (claimed upper and lower surfaces) and an edge between the upper and lower surfaces (fig. 11); providing a chuck for elevating the substrate above an upper surface of the chuck using a suspension fluid, which delivered from an annular opening located proximate to an edge of the chuck, the fluid in contact with the bottom surface proximate to the edge of the substrate (fig. 12, 14; col. 14, line 1-5); processing the top surface of the substrate with a first fluid (col. 13, line 52-55; col. 14, line 5-10). Unlike claimed invention, Futase doesn't describe controlling or maintaining the temperature, T, of the suspension fluid at temperature different from the ambient temperature in order to affect the processing of an edge region of the top surface of the substrate.

Ito describes a method for processing a substrate comprising processing the upper surface with a solution (col. 7, line 4-5) and supplying a fluid against the lower surface including the circumferential portion or edge of the substrate and controlling the T of the fluid by heating or cooling it (claimed maintaining it at T different from the ambient T) (col. 4, line 20-25; col. 7, line 20-34; col. 8, line 17-24, line 34-42; col. 10, line 39-47). It would have been obvious for one skill in the art at the time of the invention to modify Futase in light of Ito because Ito teaches that controlling the T by heating or cooling the T would provide uniform T profile of the substrate and improve the etching uniformity over entire of the surface (col. 3, line 45-col. 4, line 5).

Referring to claims 3 and 4, Futase describes the suspension fluid is nitrogen (col. 14, 2).

Referring to claims 5, 14, heating the substrate would read on claimed increasing the T of the fluid above an ambient T (Ito: col. 8, line 34-42). Referring to claim 6, increasing the T of the substrate would also increase T of the etchant; therefore increasing the etch rate of the substrate.

Referring to claims 7, 14, cooling the substrate would read on claimed decreasing the T of the fluid below an ambient T (Ito: col. 10, line 39-47). Referring to claim 8, decreasing the T of the substrate would also decrease the T of the etchant; therefore, decreasing the etch rate of the substrate.

Referring to claims 12, 16, Futase describes rotating the chuck (col. 14, line 10-15).

Referring to claim 9 and 10, Futase's chuck would read on claimed Bernoulli chuck since it can provide functions as that of the claims. Even if it is not the case, Bernoulli chuck is known to one skill in the art at the time of the invention for processing a substrate (please see cited art

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below). Therefore, at the time of the invention, using any chuck including a Bernoulli chuck would be obvious as long it can support a substrate and provide a fluid at the bottom surface of the substrate. Using a Bernoulli chuck would provide claimed invention with a reasonable expectation of success.

Referring to claim 11, applied prior art is silent about the top surface is processed at ambient pressure. However, since it is processed by a solution and not a gas, it would have been obvious to one skill in the art that the process is done at ambient pressure.

Referring to claims 15, 21, Ito suggests using a sensor to control the temperature of the fluid (col. 8, line 30-33, line 55-60). Therefore, it would have been obvious at the time of the invention for one skill in the art to use a T sensor in order to sense the T at the edge of the substrate to provide a uniform T profile of the substrate for etching with a reasonable expectation of success.

5. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futase and Ito as applied to claim 21 above, and further in view of JP 11-6081.

Referring to claims 22, 23, Ito describes using the cooler device and the heater (col. 8, line 24-40). Even though Ito is silent about using a controller for displaying the T and the controller being electrically connected to the T sensor and the thermal device to heat or cool the substrate, using T sensor, indicator (display the T), and the T controller to control T during the etching is well known to one skilled in the art as shown here by JP-11-6081 (please see the abstract). Therefor, it would be obvious to any skilled in the art that a display and a T controller must be used in connection to the T sensor in order to control the T at the peripheral and the center of the substrate being etched as taught by Ito.

***Response to Arguments***

6. Applicant's arguments filed 7/2/04 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the second fluid taught by Ito has no direct physical contact with the substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Directing the second fluid against the substrate doesn't mean it is necessary to be in direct physical contact with the substrate. Figure 9, col. 9, line 24-29 suggest that the fluid device can be directly against the substrate. This would provide the fluid to be against the substrate.

The edges are maybe beyond the edges of the device 104. However, it is still closed enough to the edge to control the T of the edge region of the substrate (col. 7, line 20-34; col. 8, line 17-24, line 34-42; col. 10, line 39-47). Therefore, it still read on claimed controlling the T of the second fluid in order to affect a processing of an edge region of the upper side of the substrate.

The motivation for combining Futase and Ito is suggested by the prior art Ito. Again the motivation to combine is because Ito teaches that controlling the T by heating or cooling the T would provide uniform T profile of the substrate and improve the etching uniformity over entire of the surface (col. 3, line 45-col. 4, line 5).

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Referring to applicant's argument about the second fluid in Futase cannot be flowed in such as a device as taught by Ito, this does not address the above rejection. The rejection is to control the T at the edge region to provide uniform T profile of the substrate and improve the etching uniformity over entire of the surface as taught by Ito. Applicant has not traversed that Ito suggests controlling the T at the edge using the fluid in order to provide uniform T profile of the substrate and improve the etching uniformity over entire of the surface.

Referring to applicant's argument that Ito does not describe the use of a T sensor is found unpersuasive because the whole Ito art talks about controlling the T of the substrate to provide uniform etching by heating or cooling the substrate and he talks about using a sensor. It is obvious that this sensor must be a T sensor; otherwise, it would be impossible to control the T without any T sensor. Therefore, the combined method of Futase and Ito would provide heating or cooling at the annular opening to a predetermined value.

7. Engesser (US 2002/0050244) is cited to show prior art (paragraphs [0012]-[0014]).

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 21-23 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.



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the applicant has not shown where in the specification suggesting the new limitations of claims 21-23.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-3:30; with alternate Friday off.

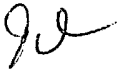
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DVD

9/14/04

A handwritten signature in black ink, appearing to be 'JD' or similar, located below the date.